REMARKS/ARGUMENTS

By this Amendment, claims 1, 8 and 28 are amended. Claims 29-36 are added. Claims 4 and 7 are canceled. Claims 1-3, 5, 6 and 8-36 are pending.

Favorable reconsideration is respectfully requested in view of the foregoing amendments and the following remarks.

The Examiner sets forth that Applicant's arguments filed on 10/24/2007 have been fully considered but they are not persuasive.

The Examiner further sets forth the Applicants' Argument: Applicants argue that Wang does not disclose or suggest that the scatterer coefficients determined can be used for equalizing and demodulating the data signals transmitted via a time-variant channel to a receiver according to the Examiner.

The Examiner further sets forth the Examiner's Response: Examiner asserts that Wang does not disclose that the data signal is equalized with the scatterer coefficients and then demodulated with them according to the Examiner. However, according to the Examiner Wiedeman discloses a receiver apparatus comprising an equalizer and a demodulator, wherein the equalizer equalizes a Doppler frequency offset (interpreted by the Examiner as the first scatterer coefficient) for each correlated signal and the delay (interpreted by the Examiner as the second scatterer coefficient) of each of the correlated signals (the Examiner directs the Applicants' attention to column 15, last paragraph). The Examiner believes that Wiedeman further discloses that the receiver includes circuitry for combining together all equalized correlated signals to provide a demodulator with a

composite received signal (the Examiner directs the Applicants' attention to column 15, last paragraph), and that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang as suggested by Wiedeman in order to transmit the majority of the signal over the communication path(or paths) which are capable of conveying a highest quality signal (the Examiner directs the Applicants' attention to column 16, first paragraph) and as the result increase the performance of the receiver.

The Examiner further sets forth that Applicants' Argument: Applicants argue that there is no teaching or suggestion in Wiedeman's reference that a receiver receiving data signal transmitted via a single carrier or a multi-carrier data-transmission on a time-variant channel can use the scatterer coefficients for equalizing and demodulating the received data signal according to the Examiner.

The Examiner further sets forth that Examiner's Response: in response to applicant's arguments against the references individually, one cannot show non obviousness by attacking references individually where the rejections are based on combinations of references according to the Examiner. The Examiner directs the Applicants' attention to *In re Keller*, 642F.2d 413, 208 USPO 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPO 375 (Fed. Cir. 1986).

The Examiner sets forth that the drawings were received on 10/24/2007 and that these drawings are accepted.

The Examiner further sets forth that claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. As to claim 4, the Examiner believes that

limitation, the measurement of the scatterer coefficients ... is in the context of multi-carrier data transmission schemes for receiving known data sequences, is vague. Accordingly, claim 4 is canceled.

The Examiner sets forth that claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. ("Generation of scattering functions by computer simulation for mobile communication channels", Vehicular Technology Conference, 1996. 'Mobile Technology for the Human Race'., IEEE 46th; Publication Date: 28 Apr-1 May 1996, Volume: 3, On page(s): 1443-1447 vol.3.), in view of Wiedeman et al. (hereafter, referred as Wiedeman) (US 5,796,760).

As to claim 1, the Examiner believes that Wang discloses a data signal transmitted via a time-variant channel to a receiver (the Examiner directs the Applicants' attention to page 1443), wherein scatter coefficients including attenuation (the Examiner directs the Applicants' attention to page 1444, left column), delay and Doppler frequency (the Examiner directs the Applicants' attention to see page 1444, right column) in the received data signal, which the Examiner sets forth cause signal distortion in the channel, are measured in the receiver (the Examiner directs the Applicants' attention to pages 1443 and 1444). Although the Examiner believes that Wang does not disclose that the signal is transmitted using a single-carrier or multi-carrier, in order to transmit the signals from transmitter to the receiver, inherently, there must be at least one carrier(single carrier) according to the Examiner. The Examiner further believes that Wang discloses all the subject matters claimed in claim 1, except that the data signal is equalized with the scatterer coefficients and then demodulated with them and that Wiedeman discloses a receiver apparatus comprising an equalizer

and a demodulator, wherein the Examiner believes that the equalizer equalizes a Doppler frequency offset (interpreted by the Examiner as the first scatterer coefficient) for each correlated signal and the delay (interpreted by the Examiner as the second scatterer coefficient) of each of the correlated signals (the Examiner directs the Applicants' attention to column 15, last paragraph). The Examiner further believes that Wiedeman further discloses that the receiver includes circuitry for combining together all equalized correlated signals to provide a demodulator with a composite received signal (the Examiner directs the Applicants' attention to column 15, last paragraph). Therefore, the Examiner sets forth it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang as suggested by Wiedeman in order to transmit the majority of the signal over the communication path(or paths) which are capable of conveying a highest quality signal (the Examiner directs the Applicants' attention to column 16, first paragraph) and as the result increase the performance of the receiver.

As to claim 3, the Examiner sets forth that Wang does not expressly disclose that the measurements have been taken place in the context of single-carrier data transmission schemes. However, in order to transmit the signals from transmitter to the receiver, inherently, there must beat least one carrier (single carrier) according to the Examiner.

The Examiner further sets forth that claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang and Wiedeman, further in view of Borowski (US 3,997,841).

As to claim 2, the Examiner believes that Wang discloses that the measurement of the scatterer coefficients has been taken place in the time domain (the Examiner directs the Applicants'

attention to the abstract and page 1443, right column) and that Wang and Wiedeman disclose all the subject matters claimed in claim 2, except that the equalization of the data signal takes place within the time domain. The Examiner further believes that Borowski discloses that the advantages of the time-domain equalizers are that sufficient noise suppression can be achieved, which the Examiner believes permits the use of a low-noise amplifier with sufficient control range (the Examiner directs the Applicants' attention to column 1, paragraph 4). Therefore,, for the reasons stated above, the Examiner believes that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang and Wiedeman in order to use a time domain equalizer to equalize the data signal.

The Examiner further sets forth that claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang and Wiedeman, further in view of Schenk et al. (hereafter, referred as Schenk) (US 6,647,076).

As to claim 5, the Examiner believes that Wang discloses that the measurement of the scatterer coefficients has been taken place in the frequency domain (the Examiner directs the Applicants' attention to the abstract and page 1443, right column) and that Wang and Wiedeman disclose all the subject matters claimed in claim 5, except that the equalization of the data signal takes place within the frequency domain. According to the Examiner, Schenk discloses that a frequency domain equalizer is used for the channel equalization of a signal vector (the Examiner directs the Applicants' attention to column 5, lines 35-40). Schenk further discloses that the frequency domain equalizers require a smaller outlay on circuitry than time domain equalizers and

can be implemented as a simple and fast algorithm and as a simple circuit (the Examiner directs the Applicants' attention to column 2) and that, therefore, for the reasons stated above, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang and Wiedeman to use a frequency domain equalizer to equalize the data signal according to the Examiner.

The Examiner further sets forth that claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Wiedeman, and Schenk, further in view of Schafhuber et al. (hereafter, referred as Schafhuber) (Adaptive prediction of time-varying channels for coded OFDM systems Schafhuber, D.; Matz, G.; Hlawatsch, F.; Acoustics, Speech, and Signal Processing, 2002. Proceedings. (ICASSP '02). IEEE International Conference on Volume 3, 13-17 May 2002 Page(s):III-2549 - III-2552 vol.3).

As to claim 6, the Examiner believes that Wang, Wiedeman, and Schenk disclose all the subject matters claimed in claim 6, except that the measurements of the scatterer-coefficients and the equalization of the data signal is in the context of multi-carrier data transmission schemes. The Examiner sets forth that Schafhuber, in the same field of endeavor, teaches determining a scattering function (the Examiner directs the Applicants' attention to page 2549, right paragraph), and therefore inherently the scatterer-coefficients, and the equalization of the data signal (the Examiner directs the Applicants' attention to Fig. 2) in the context of multi-carrier data transmission schemes (i.e. the OFDM) (the Examiner directs the Applicants' attention to page 2549) and that it would have been obvious to one of ordinary skill in the art at the time of invention to use the teachings of Wang,

Wiedeman, and Schenk, to make the system disclosed by Schafhuber more simple and cost effective according to the Examiner.

The Examiner further sets forth that claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang and Wiedeman, further in view of Ratnarajah et al. (hereafter, referred as Ratnarajah)(US 6,757,339).

As to claim 9, the Examiner believes that Wang and Wiedeman disclose-all the subject matters claimed in claim1, except that a first measurement of the scatterer coefficients is implemented with the assistance of a known data sequence. According to the Examiner, Ratnarajah discloses a method for estimating the sequence of transmitted symbols in a digital communication system (the Examiner directs the Applicants' attention to the abstract). The Examiner believes that Ratnarajah discloses that the channel impulse response coefficients (i.e. interpreted by the Examiner as scatterer coefficients) are determined from training symbols embedded in the transmitted data sequence (the Examiner directs the Applicants' attention to column 1, lines 37-49) and that it would have been obvious to one of ordinary skill in the an at the time of invention to modify Wang and Wiedeman as suggested by Ratnarajah, to more accurately determine the coefficients according to the Examiner.

The Examiner further sets forth that claims 7, 8, and 10-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Accordingly, claim 1 has been amended to include the limitations of claim 7, new claim 29 has been added including the limitations of claim 1 and claim 10, and new claim 33 has been added including the limitations of claim 1 and claim 27.

Therefore, amended independent claim 1 recites a method for equalizing and demodulating a data signal transmitted using a single-carrier or multi-carrier data-transmission procedure via a time-variant channel to a receiver, wherein scatterer coefficients including attenuation, delay and Doppler frequency in the received data signal, which cause signal distortion in the channel, are measured in the receiver, and the data signal is equalized with the scatterer coefficients determined in this manner and then demodulated with them and wherein the scatterer coefficients are measured via a maximum likelihood criterion.

New independent claim 29 recites a method for equalizing and demodulating a data signal transmitted using a single-carrier or multi-carrier data-transmission procedure via a time-variant channel to a receiver, wherein scatterer coefficients including attenuation, delay and Doppler frequency in the received data signal, which cause signal distortion in the channel, are measured in the receiver, and the data signal is equalized with the scatterer coefficients determined in this manner and then demodulated with them and wherein the first measurement of the scatterer coefficients is implemented block-wise over an entire data sequence.

New independent claim 33 recites a method for equalizing and demodulating a data signal transmitted using a single-carrier or multi-carrier data-transmission procedure via a time-variant channel to a receiver, wherein scatterer coefficients including attenuation, delay and Doppler

frequency in the received data signal, which cause signal distortion in the channel, are measured in the receiver, and the data signal is equalized with the scatterer coefficients determined in this manner and then demodulated with them and wherein the first measurement of scatterer coefficients is implemented exclusively with unknown useful data sequences, and that default values are used in the initialization of the algorithm instead of the training and synchronization sequences.

Since the Examiner has indicated allowable subject matter in claims 7, 10 and 27, it is respectfully submitted that claims 1, 29 and 33 are allowable and that the above-identified application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are respectfully requested.

Should the Examiner believe that anything further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

CAESAR, RIVISE, BERNSTEIN,
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Please charge or credit our Account No. 03-0075 as necessary to effect entry and/or ensure consideration of this submission.